BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Subsidiary Diploma in Applied Science Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Environmental Science
Unit number and title	**Unit 13: Biological Molecules and Metabolic Pathways**
Learning aim(s) (For NQF only)	**C:** Explore the factors that can affect the pathways and the rate of photosynthesis in plants
Assignment title	**Photosynthesis in Plants**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are carrying out a work experience placement at the local garden centre. Your supervisor has asked you to produce a report about the factors that can affect the rate of photosynthesis in plants, including the stages involved in the process. You are expected to complete a relevant investigation into a factor that affects the rate of photosynthesis and your supervisor has allocated time for you to complete this as part of your work experience placement.

Task	Produce a portfolio (report, leaflet, practical investigation write up) **evaluating**, **analysing** and **explaining** the factors affecting photosynthesis and how this and other factors affect the rate and efficiency of photosynthesis. Always use correct and accurate scientific terminology. Your portfolio should include: • A leaflet that clearly **explains** the light-dependent and light-independent chemical reactions involved in photosynthesis. Provide **detailed reasons** of the importance of each stage of the process. • A practical investigation into the effects of factors on the rate of photosynthesis. o **Carry out an investigation** into **ONE of the following** factors affecting the rate of photosynthesis: ▪ light intensity (including the wavelength of light and related pigments) ▪ carbon dioxide concentration ▪ temperature **The practical work needs to be risk assessed before it is carried out – ALSO SEE NOTE TO ASSESSORS** o Provide outline details (e.g. write up, sections from your lab book, photographs) of the investigation you carried out and

	include any changes you made to a method you had been given. o Show where repeats have been carried and identify and discuss anomalous results. **Analyse** the primary data for the factor you have investigated (light intensity, carbon dioxide or temperature) along with secondary data you have obtained either by researching secondary sources or have been given by your Supervisor. Draw accurate, valid and detailed conclusions about the effect of the factor on the rate of photosynthesis, referring to the stage in photosynthesis affected. Interpret all the data you have collected to show key trends and interrelationships. Link the factor and its effects on the rate of photosynthesis to the stage(s) in photosynthesis. Consider any differences between your primary data and published material. o An observation record, signed by your teacher is required to validate the practical work you carried out • A report, which: o **Evaluates** the advantages and disadvantages of how changing the levels of light intensity, carbon dioxide and temperature can affect the efficiency of the main stages of photosynthesis. Link this to the commercial importance and relevance in terms of yield and production costs. Include optimum levels of these factors affecting the rate of photosynthesis. An example could consider a conclusion about the relevance, in terms of yield and production costs, of increasing levels of light or carbon dioxide in a greenhouse or other commercial context. You should use your understanding of the main stages in photosynthesis when drawing your conclusions from the analysis of primary and secondary data.
Checklist of evidence required	A detailed report to include: • An evaluation of the factors that affect photosynthetic efficiency • An analysis of primary and secondary data, which explains the outcomes of an investigation into factors that affect the rate of photosynthesis • Evidence of the practical work you carried out, observation record, Laboratory logbook, etc. • A leaflet explaining the chemical stages of photosynthesis • Sources of information using a standard referencing system e.g. Harvard

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
C.D3	Evaluate the effect of factors on photosynthetic efficiency.
C.M4	Analyse primary and secondary data to explain the outcomes of an investigation into a factor that affects the rate of photosynthesis.
C.P6	Carry out an investigation into a factor that affects the rate of photosynthesis.
C.P5	Explain the stages involved in photosynthesis in plants.

Sources of information to support you with this Assignment	Hartley, J. et al. *Pearson BTEC National Applied Science Student Book 1*, 2016 (ISBN; 978-1292134093) All sources of information suggested are UK based. Centres are free to amend these sources to those available in the Country of delivery where more appropriate.

	Blankenship, Robert E., *Molecular Mechanisms of Photosynthesis*, 2nd edition, Wiley-Blackwell, 2014 (ISBN: 978-1405189750) Ferrier, Denise R., *Biochemistry (Lippincott's Illustrated Reviews Series)*, 6th edition, Lippincott Williams and Wilkins, 2013 (ISBN: 978-1451187533). An illustrated book to help the learner – written expressly for advance level learners. Williams, Andrew, *Photosynthesis – Advanced Biology Study Notes: For Teachers and Students* (includes a mock exam), 1.2 edition, CreateSpace Independent Publishing, 2013 (ISBN: 978-1493588855) http://www.s-cool.co.uk/a-level/biology/photosynthesis http://biology.clc.uc.edu/Courses/Bio104/photosyn.htm http://www.biologymad.com/master.html?http://www.biologymad.com/PhotosynResp/PhotosynResp.htm http://www.saps.org.uk/secondary/teaching-resources/190-using-pondweed-to-experiment-with-photosynthesis http://www.nuffieldfoundation.org/practical-biology/investigating-factors-affecting-rate-photosynthesis http://www.rsc.org/learn-chemistry/content/filerepository/CMP/00/001/068/Rate%20of%20photosynthesis%20limiting%20factors.pdf http://www.saps.org.uk/secondary/teaching-resources/157-measuring-the-rate-of-photosynthesis
Note to Assessors	Different factors should be investigated by different learners in the class to ensure all factors are covered and that learners work independently. Results should be collated to give learners access to secondary data for other factors for the purpose of analysis, when evaluating all three factors influencing the rate of photosynthesis. It is the centre's responsibility to carry out risk assessments prior to investigations being undertaken. The practical activities suggested for this assignment are required to be safety checked by the centre before use. Pearson Education can take no responsibility for the safety of any practical activities. Before doing a practical activity you should always carry out your own risk assessment and refer to the necessary regulations. In particular, any local rules issued by your employer must be obeyed, regardless of what is suggested here. Learners are not being assessed on their ability to plan a practical investigation. They are being assessed on their ability to carry out an investigation.